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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,268	04/11/2006	Volker Hennige	287417US0PCT	8870

22850 7590 03/03/2010

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EXAMINER	
FORTUNA, ANA M	
ART UNIT	**PAPER NUMBER**
1797	

NOTIFICATION DATE	DELIVERY MODE
03/03/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/575,268	HENNIGE ET AL.	
	Examiner	Art Unit	
	ANA M. FORTUNA	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26 and 28-34* is/are pending in the application.

4a) Of the above claim(s) *2,14-26,28 and 31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-13,29,30 and 32-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

ELECTION

In response to applicant's comments regarding to the elected claims in paper of 10/10/08, claims 1-13, 29, 30 were elected. Some changes in the number of claims that belong to group I , are made as follow, which regroup claim 14, and the added claims:

Group I includes claims 1, 3-13, 29, 30, and 32-34.

Claim 14 is being made part of groupie, directed to the process of making the membrane.

In this rejection only group I will be considered. Applicant can request rejoined of claims 28 and 31 after allowability of the product membrane claim is determined to be in conditions for allowance.

Double Patenting

The rejections based on Provisional Obvious type Double patenting is withdrawn, based on the amendments and indicated allowability of the copending parent application 10/524,143. Rejection over 10/524,669 is also withdrawn, due to the silicon network claimed in claim 1 (amended).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-13, and 29, 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Canadian patent 2477062 (CA'062) (Equivalent to WO 03/073534).

Patent CA'062 discloses the membrane composition of claim 1, comprising a support and at least one of aluminum oxide, zirconium oxide, titanium oxide and silicon oxide and mixtures thereof, using oxide particles within ranges claimed and the silicon alumina bonding between the oxides coating and the support material is also disclosed in this reference (CA '062) (page 3, last paragraph bridging page 4; page 4, lines 10-29; page 6, last paragraph bridging page 7).

The ceramic materials coating comprising the claimed oxides or the mixtures of oxides as in claim 1 are disclosed (see page 8, second paragraph, through page 9, line 17, column 10, second paragraph; page 12, lines 34-39). The oxides particle size is disclosed (page 13, second paragraph). The later particle size selection is suggested for producing a membrane with suitable bendability (flexibility) (page 13, second paragraph).

Claim 1 includes the limitation of '"**wherein the second fraction comprises a silicon network bonded (i) via oxygen atoms to said oxides of said ceramic coating, (ii) via organic radicals to said polymeric nonwoven (support) and (iii)via at least one carbon chain to a further silicon atom"**, the latter limitation is not textually recited in the CA'062 patent.

In this current specification (10/575268) applicant discloses the same type of adhesive promoters (age 18, lines 11-22) suggested in CA'062 (page 13, lines 14-21),

in the latter section of CA'062, the combination of more than one adhesive is suggested, e.g. octylsilanes, fluorinated octysilanes, vinylsilanes, the amine-functionalized silanes and/or glycidyl-functionalized silanes; which adhesives are further disclosed in details on page 14, lines 16-29), as AMEO, DAMO, GlYMO (glycidyl-functionalized silane), etc.

In the description of adhesive promoters in page 13, discussed above, the term "and/or" suggests that GlYMO (glycidyl-functionalized silane) can be combined with the rest of the listed adhesive promoters, such as AMEO, DAMO, MEMO, etc.

In current application the addition of more than one adhesive promoter is a preferred (page 18, lines 18-22). Based on the teaching of CA'062, the skilled in the art at the time this invention would have been motivated to alternatively combine GLYMO with the additional promoter as suggested, and the adhesion improvement will be inherently provided to the resulting membrane.

The claimed **bonding** between the organic, inorganic chains and the polymeric organic support, as claimed in claim 1 (discussed above), would have been also predicted by the skilled artisan at the time this invention was made, when making the membrane from a sol containing the mixture of inorganic oxides in a sol and in presence of the same adhesive promoters mixture, such as the ones used by Applicant (example 1), e.g. AMEO (3-aminopropyltriethoxysilane) and GLYMO (3-glycidyloxytrimethoxysilane), which are part of the promoters **and/or** mixture of promoters **suggested in CA'062, as discussed above.**

The ceramic fractions, e .g 1-30 parts and 4-94 parts are suggested CA'062 patent; the patent teaches making the coating with an oxide content of about 40 % of the composition (example1 equivalent of to 125 g or the total components). Using "at least one" oxide of the metals Al, Zr, Si, Ti, and or Y in a sol is also disclosed (page 26, claim 14), as claimed in current claim 4. The skilled in this art at the time this invention was made selecting more than one oxide for the coating can be motivated to add a mixture equivalent to the total amount of oxide suggested by the patent. Since the particle sizes an its effects in the final filter or membrane product are suggested in the patent, the skilled artisan at the time this invention was made would have been able to tailor the final membrane product based on the percentage or parts of each of the oxides or oxides fractions having a particular size, depending on the degree of flexibility and porosity desired, as suggested in this patent (page 13, lines 9-12).

As in current specification and claim 1, CA'062 teaches using polymeric fibers as substrate, and use adhesion promoters admixed with the suspension (to be coated on the substrate); the adhesion promoters are disclosed as organofunctional silanes (page 13, lines 14 through page 14, line 29). The listed adhesive promoters include octylsylanes, fluorinated octylsilanes, vinylsilanes, amine-functionalized silanes (AMEO, DAMO), 3-methacryloyloxypropyltrimethoxysilane and/or glycidyl-functionalized silanes (GLYMO) (page 13, lies 19-30; page 14, lines 16-29).

Current specification, page 13, second paragraph, teaches the formation of the claimed silicon network by using at least two adhesive promoters. And further states that "It is believed that the same effect can be achieved when at least one UV irradiation

treatment is applied to a single UV -active adhesion promoter is added to the suspension.

Because CA'062 also teaches the application of adhesive promoter or mixtures including glycidyloxytrimethoxyoxysilane (GLYMO) and or (MEMO), as discussed in pages 13-14 above, and further teaches heating the suspension on the substrate by irradiation (page 14, last line through page 16, line 27), the skilled artisan at the time this invention was made can predict that by using the same adhesive promoters or an adhesive promoter which is radiation sensitive, such as, MEMO, the reaction can produce the same type of bonding (to the support and oxide) as claimed in the current invention , because the treatment to achieve the particular silicon network is the same as CA'062, or it would have been obvious to the skilled in this art at the time this invention was made, based on the suggested adhesive promoters and or its combinations and irradiation treatment.

Furthermore, CA'062 suggest the combination of aminofunctionalized silanes (AMEO, DAMO) and glycidyl-functionalized silanes (GLYMO) (page 13, lines 19-22);'which is one of the Applicant's preferred embodiments (see Applicant's specification, page 13, last paragraph). In applicant's process and CA'062, both promoters application is followed by irradiation, therefore, the skilled artisan can expect the same type of silicon network and linkages to the oxide and polymeric support.

As to claims 3, 4, preparing the particles fractions in via a sol are disclosed in the patent (page 16, second and third paragraphs, examples 1 and 2).

The thickness is further disclosed in this patent (see page 7, second paragraph).

As to claim 7, the substrate materials are disclosed (page 7, third paragraph, and page 13, lines 22-29).

As to claims 8, 10, 11, 12, CA'062 does not discloses the specific parts of each of the oxides in the mixture, however, the skilled artisan would have been motivated to vary the amount of a particular oxide or particle size of the oxide to optimize the resulting membrane, e.g. adhesion, flexibility.

Regarding to claims 6 and 9, the particles surface area, when the fraction selected is alumina, is inherent in the particles used in CA'062, both the present invention and CA'062 use similar particles, e.g. MZS-1, MZS-3 ('062, page 22, lines 18-22); (see current specification, page 17), therefore the BET should be the same (see page 14, first paragraph).

As to claim 13, the bendability in CA'062 is disclosed as down to a radius of 10-2 mm (page 8, last paragraph).

As to claim 5, see (page 20, last paragraph).

As to claims 29-30, the use as separators or electrodes, or electrodes devices and batteries is disclosed in this patent (abstract).

Claims 32-34 are covered by the discussion of mixing adhesive promoters above. Promoters as AMEO and DAMO are suggested for bonding the inorganic coating to the a polymeric support made of polyamide (Table at page 14), the skilled artisan at the time this invention was made to have reasonable expectation of success if both adhesives are applied to a polyamide support to bond the organic to the inorganic oxides.

Expected beneficial results are evidence of obviousness of a claimed invention, just as unexpected results are evidence of unobviousness. In re Skroner, 186 USPQ 80 (CCPA 1975).

CA'062 does not show in examples the combination of adhesive promoters; however, a disclosure in a reference is not limited to its specific illustrative examples, but must be considered as a whole to ascertain what would be realistically suggested thereby to one of ordinary skilled in the art. In re Uhlig, 54 CCPA 1200, 376 F2d 320; 153 USPQ 460.

Response to Arguments

Applicant's arguments filed 2/5/2010 have been fully considered but they are not persuasive. The finality of the previous rejection is withdrawn. The double patenting rejections are withdrawn. Rejection over Davison in combination with CA '062 is withdrawn to simplify the rejections, since the main argument is directed to the claimed "bonding" with the adhesive promoters's mixture". In the above rejection the examiner explain in detail the interpretation of the claims based on the analysis of the specifications of both, current application, and the CA'062 patent. Applicant argues that the bonding is different, however, does not, detail what happens when a mixture of adhesive promoters is used to bond the inorganic oxides to the polymeric substrate, which is one alternative, as discussed above. Applicant argues that the Examples in CA'062 do not show mixing two adhesive promoters; as discussed above, the disclosure in the later patent is not limited to examples, therefore, the disclosure in page

13, second paragraph, discussed in the rejection above, suggest adding GLYMO to any of the other listed promoters.

Applicant in response to this Office action is invited to provide evidence of that the combination of promoters do not produce the claimed bond between theoxides and substrate.

In response to the method of heating after the coating of the substrate, patent CA'062 teaches irradiation and more particular "infrared radiation, as in current invention (page 15, lines 25-27).

Information disclosure statement filed 2/5/2010 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patents 7,563,827, 6,626,987, 7,183,370 disclosed using

adhesives of the type disclosed in this application and using mixtures of the adhesives to bond oxide particles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANA M. FORTUNA whose telephone number is (571)272-1141. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANA M FORTUNA/
Primary Examiner, Art Unit 1797